# 386 | DEBUG Reference Card

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## Conventions

| | |
|---|---|
| `courier` | indicates command line syntax |
| *`italics`* | indicate a name or value that must be entered by the user |
| `[ ]` | (brackets) indicate optional items or information |
| `\|` | (vertical bar) separates alternative items |

# Commands-Functional Listing

## 386|DEBUG Options

### Redirect Debugger I/O

| | |
|---|---|
| To serial channel #1 | `COM1` |
| To serial channel #2 | `COM2` |
| To console (CON) | `CON` |

### Memory Models

| | |
|---|---|
| Show current model | `M?` |
| Assume small model | `MS` |
| Assume compact model | `MC` |
| Assume medium model | `MM` |
| Assume large model | `ML` |

### Address Formation

| | |
|---|---|
| Assume protected mode addresses | `PROT` |
| Assume real mode addresses | `REAL` |

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## Breakpoints and Watchpoints

### Set

| | |
|---|---|
| Set breakpoints | BP *address* |
| Set watchpoints | WP *addr datalen* [*r*\|*w*] |

### Clear

| | |
|---|---|
| Clear breakpoints | BC *breakpoints* \| * |
| Clear watchpoints | WC *watchpoints* \| * |

### List

| | |
|---|---|
| List breakpoints | BL |
| List watchpoints | WL |

### Enable

| | |
|---|---|
| Enable breakpoints | BE *breakpoints* \| * |
| Enable watchpoints | WE *watchpoints* \| * |

### Disable

| | |
|---|---|
| Disable breakpoints | BD *breakpoints* \| * |
| Disable watchpoints | WD *watchpoints* \| * |

## Display Active Procedure Calls

| | |
|---|---|
| Display call stack | K [*arg_count*] |
| Display call stack and arguments | KA |

## Display System Tables

### Dump Descriptor Tables

| | |
|---|---|
| Global Descriptor Table | DG [*range*] |
| Interrupt Descriptor Table | DI [*range*] |
| Local Descriptor Table | DL [*range*] |

### Page Table Info

| | |
|---|---|
| Display at address | PI address |
| Display at linear address | PL linaddr |

### Dump Task State Segments

| | |
|---|---|
| Display TSS at selector | DTSS [*selector*] |
| Display 386 TSS at address | DTSS32 *address* |
| Display 286 TSS at address | DTSS16 *address* |

## Examine/Change Memory

### As Data

| | |
|---|---|
| Hex bytes | DB [*range*] |
| Hex words | DW [*range*] |
| Hex double | DD [*range*] |
| ASCII | DA [*range*] |
| Last format | D [*range*] |
| As Floating Point (8-byte) | DQ [*range*] |
| (4-byte) | DS [*range*] |
| (10-byte) | DT [*range*] |

### As Code (Unassembled)

| | |
|---|---|
| Unassemble memory | U [*range*] |
| In 16-bit mode | U16 [*range*] |
| In 32-bit mode | U32 [*range*] |

*continued*

## Examine/Change Memory (cont.)

**Enter (Change) Memory**

| | |
|---|---|
| By bytes | E *address value(s)* |
| By bytes | EB *address value(s)* |
| By words | EW *address value(s)* |
| By doublewords | ED *address value(s)* |

**Memory Block Operations**

| | |
|---|---|
| Compare blocks | C *range address* |
| Move block | M *range address* |
| Fill block | F *range value(s)* |
| Search block for string | S *range value(s)* |

## Examine/Change Registers

| | |
|---|---|
| Display or change registers | R [*register*] [*value*] |
| Display extended registers | RX |
| Display 80387 registers | R87 |
| Display Weitek registers | R67 |
| Display Weitek registers | R67D |
| Display Weitek registers in single precision | R67S |

## Execute and Trace

| | |
|---|---|
| **Go (and set breakpoints)** | G [=*address*] [*address(es)*] |

**Trace (skipping CALL instructions)**

| | |
|---|---|
| Verbose | P [=*address*] [*count*] |
| Quiet | PQ [=*address*] [*count*] |

**Trace (single-step)**

| | |
|---|---|
| Verbose | T [=*address*] [*count*] |
| Quiet | TQ [=*address*] [*count*] |

## I/O

**Port**

| | |
|---|---|
| Input from port | I *port* |
| Output to port | O *port value* |

## Interactive Commands

| | |
|---|---|
| Display debugger commands | ? [char] |
| Hex Arithmetic | H *value value* |
| Quit | Q |

## Symbol Table

| | |
|---|---|
| Display symbol table | X [*symbol*] |
| Relocate symbol table | XR *old_sel new_sel* |
| Display segment names | XS |
| Locate symbol at address | XW *address* |

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# Commands-Alphabetical Listing

| | |
|---|---|
| ? [*char*] | Display debugger commands |
| BC *breakpoints* \| * | Clear breakpoints |
| BD *breakpoints* \| * | Disable breakpoints |
| BE *breakpoints* \| * | Enable breakpoints |
| BL | List all breakpoints |
| BP *address* | Set breakpoints |
| C *range address* | Compare memory |
| COM1 | Redirect I/O to COM1 |
| COM2 | Redirect I/O to COM2 |
| CON | Return I/O to console |
| D [*range*] | Dump memory (repeating last format) |
| DA [*range*] | Dump memory in ASCII |
| DB [*range*] | Dump memory as individual bytes |
| DD [*range*] | Dump memory as hex doublewords |
| DF [*range*] | Dump memory as floating point (4-byte) |
| DG [*range*] | Dump GDT |
| DI [*range*] | Dump IDT |
| DL [*range*] | Dump LDT |
| DQ [*range*] | Dump memory as floating point (8-byte) |
| DS [*range*] | Dump memory as floating point (4-byte) |
| DT [*range*] | Dump memory as floating point (10-byte) |
| DTSS [*selector*] | Dump task state segment |
| DTSS16 address | Dump 286 TSS at address |
| DTSS32 address | Dump 386 TSS at address |
| DW [*range*] | Dump memory as hex words |
| E *address value(s)* | Enter (change) memory by bytes |
| EB *address value(s)* | Enter (change) memory by bytes |
| ED *address value(s)* | Enter (change) memory by doublewords |
| EW *address value(s)* | Enter (change) memory by words |
| F *range value(s)* | Fill memory |
| G [=*address*] [*address(es)*] | Go (and set temporary breakpoints) |
| H *value value* | Hex arithmetic |
| I *port* | Read byte value from input port |
| K [*arg_count*] | Display procedure call stack |
| KA | Display call stack with arguments |
| M *range address* | Move memory |
| M? | Show current memory model |
| MC | Select compact memory model |
| ML | Select large memory model |
| MM | Select medium memory model |
| MS | Select small memory model |
| O *port value* | Output data byte to port |
| P [=*address*] [*count*] | Trace across CALL instructions |
| PI *address* | Display page table info |
| PL *linaddr* | Display page table info |
| PQ | Trace quietly across CALL instructions |
| PROT | Assume protected mode addresses |
| Q | Quit |
| R [*register* [*value*]] | Display or change registers |
| R67 | Display Weitek registers in double precision |
| R67D | Display Weitek registers in double precision |
| R67S | Display Weitek registers in single precision |
| R87 | Display 80387 registers |
| REAL | Assume real mode addresses |
| RX | Display extended registers |
| S *range value(s)* | Search memory for string |
| T [=*address*] [*count*] | Trace (single-step) |
| TQ [=*address*] [*count*] | Trace quietly |
| U [*range*] | Unassemble memory |
| U16 [*range*] | Unassemble memory in USE16 segment |
| U32 [*range*] | Unassemble memory in USE32 segment |
| WC *watchpoints* \| * | Clear watchpoints |
| WD *watchpoints* \| * | Disable watchpoints |
| WE *watchpoints* \| * | Enable watchpoints |
| WL | List all watchpoints |
| WP *addr datalen* [*r* \|*w*] | Set watchpoints |
| X [*symbol*] | Display symbol table |
| XR *old_sel new_sel* | Relocate symbols to another selector |
| XS | Display segment names |
| XW *address* | Locate symbol at address |